Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2020-1330

Anonymous Referee #1

Referee comment on "Development of a new emission reallocation method for industrial sources in China" by Yun Fat Lam et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2020-1330-RC1, 2021

This paper provided a new industrial nonpoint source reallocation method, a NPS method, based on blue-roof industrial buildings based on satellite imagery. The results indicate using the NPS method will improve the model performance compared with the conventional method of using population density. In general, the paper is clearly organized and easy to follow, and provided a new spatial allocation emission data for the Greater Bay Area (GBA) area. However, the authors mainly compared this method with the regional emission inventories using top-down spatial allocation methods. Currently, the high-resolution emission inventories of most key regions in China adopt point-source processing based on "bottom-up" method. I encouraged the authors to expand the scope of the paper and to discuss more with the point-based high-resolution emission inventory development. Some more detailed information should also be provided and discussed, before the paper can be accepted for final publication. Details follow.

- As mentioned above, my main concern is that the discussion could be expanded a little bit, and would be focused more on the comparison with point-source based spatial allocation method. That might be more helpful for the whole research community. It invites more review on published work for the high-resolution regional emission inventory, and more comparison and discussion with these inventories.
- I can understand that using the NPS method can effectively improve the spatial allocation of emissions. However, it seems that the method should not be able to distinguish the differences in emissions between the factories. After all, using images cannot accurately determine the scale of different companies. If it cannot be distinguished, how much uncertainty was caused by this?
- The advantage of this method is to improve the spatial distribution of emissions. However, this study only selected limited city (like Zhongshan in Figure 7) when verifying the model performance. I suggest more monitoring sites should be included to reflect the advantages of improved spatial distribution.
- In “3.4 conclusion remarks”, the following sentences seem to be unnecessary repetitions of the body content, and it is recommended to delete them.
- There are some mistakes in the MS as well. (1) Line 49. “population density wasa applied as” should be “population density was applied as”. (2) Line 134. “In thi study”

should be “In this study”.